

vast majority of cases. Notwithstanding the murmur, if the valvular element of the first sound referable to the mitral valves, retain nearly or quite its normal intensity, the valves are not seriously damaged. In judging of the normal intensity of the mitral valvular element, it may be compared with the sound emanating from the tricuspid valves.

5. Abnormal intensity of the valvular element referable to the tricuspid valves, is a sign of hypertrophy of the right ventricle, and is generally associated with diminished intensity of the valvular element referable to the mitral valves. Abnormal weakness of the tricuspid valvular element is not available as a physical sign of disease.

6. A *positive* increase of the intensity of the pulmonic second sound of the heart, is a sign of hypertrophy of the right ventricle, in the majority of cases dependent on mitral contraction or insufficiency, or both. A *relative* increase of this sound, *i. e.*, as compared with the aortic second sound, may result from abnormal feebleness of the aortic sound, due to mitral obstruction or regurgitation.

7. Abnormal intensity of the aortic second sound, is not a sign of much importance. But non-diminution of its intensity, in cases in which a murmur referable to the aorta is present, is a sign of much value, indicating that, although aortic lesions exist, the integrity of the valves is not seriously compromised.

8. Diminished intensity of the aortic second sound, in cases in which a murmur referable to the aorta is present, is a sign that the aortic valves are damaged, provided that neither mitral obstruction nor regurgitation exists, an effect of the latter being abnormal feebleness of this sound. If the diminished intensity of the aortic sound be due to injury of the valves of the aorta, there will be likely to be present an aortic regurgitant murmur, in other words, a diastolic murmur referable to the aorta.

9. In cases in which a diastolic murmur is present, referable either to the direct current of blood through the mitral orifice, or to aortic regurgitation, a normal intensity of the aortic second sound is evidence that the lesions giving rise to the murmur are seated at the mitral orifice.

*Report of thirteen Cases of Ununited Fracture treated by Subcutaneous Perforation of the Bone.*—Prof. BRAINARD states (*Chicago Medical Journ.*, Sept., 1858), that since the publication of his essay on this mode of treating fractures (*Trans. Am. Med. Assoc.*, vol. vii. 1854), a more extended experience has enabled him to form a more just appreciation of the value of this treatment, to ascertain its advantages and defects, and to suggest some improvements in the manner of its performance; and further, that the views formerly expressed concerning the efficacy and safety of the operation are in the main confirmed.

Of the 13 cases of ununited fracture reported in the present paper, *four* were of the *humerus*; *four* of the *femur*; *three* of the *tibia*, and *two* of the *ulna*.

1. *Of the humerus.*—The first of these was of four months' standing, in a healthy man, 30 years of age. Two operations at an interval of ten days were performed, and a cure effected in one month.

The second was of eight months' standing, in a healthy man, 29 years of age. Four operations by perforation were performed at intervals of ten days. Union was advancing, but the patient then put himself under the care of another surgeon.

The third case was one of six months' standing, in a healthy man 24 years of age. Five operations were performed at intervals of a week, and a cure was effected in six weeks.

The fourth case was of five months' standing, in a man whose age and general condition are not stated. He was treated for five weeks by six perforations without benefit. The seton and then resection were tried without producing union.

2. *Of the femur.*—The first of these was in a man 35 years of age, delicate health, of five months' standing. Treatment by eleven perforations during five months; cure.

The second was of four months' standing, in a man 56 years of age, treated by four operations, and cured in six weeks.

The *third* was also of four months' standing, in a healthy young man; cured by four perforations.

The *fourth* case was of five months' standing, in a healthy man aged 36 years. Cured in four weeks by one operation.

3. *Tibia*.—The *first* of these was of four months' standing, in a man cured in two weeks by one perforation.

The *second* was in a man 25 years of age, of good constitution; cured in five weeks by four perforations.

The *third* was of seven months' standing, in a man of good constitution, 21 years of age; cured in four weeks by four perforations.

4. *Ulna*.—The *first* of these was in a labourer, and was of three months' standing. Cured in 22 days by two perforations.

The *second* in a man 35 years of age, a drunkard, of 18 weeks' standing; cured in four weeks by two perforations.

In none of the above cases, Dr. B. states, did any serious accident occur. "In one," he observes, "a small abscess, and in another, a subject of bad constitution, some swelling, resembling erysipelas, which, however, soon subsided. These were the most serious results of about sixty perforations. We may therefore assert, with great certainty, that this operation, unless performed upon patients in a condition unfit for any operation, is entirely safe."

It will also be noticed, that, while in cases of fracture of the tibia, where apposition is perfect and the movement slight, a single perforation speedily induced union in a few days; on the other hand, fractures of the humerus and of the femur did not, in most cases, require less than four operations, nor unite in less than four weeks, while one required five months and eleven perforations to effect a cure, and another did not unite at all.

My practice at present is to commence the treatment by two or three perforations of the bone through a single opening of the skin, using an instrument of small size, repeating this every ten days or two weeks, gradually increasing the size of the instrument and the extent of the wound of the bone, until tenderness and some swelling are induced. I have very uniformly found that when pain and throbbing are felt in the seat of fracture, union has commenced.

*Direction of the Perforator*.—That point and direction of puncture should be chosen which affords the easiest access to the bony surfaces with least exposure of vessels. In many cases of oblique fracture, traversing the bones answers well. In others, as of the tibia, I have found that following the direction of fracture is best. In others, still, when the ends are not perfectly in contact, I make a perforation between, and direct the instrument first in one direction, then in the other; while in others, still, the instrument can be passed most readily between the bones and attack them at the side.

*Size of the Instrument*.—In cases of ununited fracture of the tibia, or radius and ulna, where the ends are in contact and the wounds slight, I use a perforator no more than two or three millimetres in breadth; while, in old cases, situated in the femur and humerus, and when there is great mobility, it is as well to use an instrument one-eighth of an inch and over in breadth. In such cases, very extensive wounding and perfect denudation is required. It was not found that the bones had in any case lost their natural feeling of density.

*Causes of Want of Union*.—In all the above cases, the causes of non-union were imperfect apposition, or a dressing admitting of too great mobility, or accidents producing displacements, or indocility of the patient. In three of the cases, the fragments were separated from each other by a sensible space, as shown by the instrument in perforating them. It is especially to be noticed, that the most efficient means for securing immobility were in every case conjoined with the treatment by perforation. These means were such as are generally known and used."

A case of ununited fracture of the forearm, treated unsuccessfully by this method, will be found in the original department of this number. (p. 136-141.)

*Dislocation of the Fourth and Fifth Cervical Vertebrae*.—Dr. W. M. RYER records (*Pacific Med. & Surg. Journ.*, Sept. 1858) a case of this rare accident. The subject of it was a girl 7 years of age, of lymphatic constitution, the daugh-